This is the smoothest species known to me; the thorax has the sides distinctly but obtusely angular and impressed, without any projection before the front angles, the angles themselves slightly acute and diverging; the elytra have the striæ scarcely noticeable, except at the apex; the metasternum is entirely smooth, including the sides.

Megathopa æneicollis.

Oblongus, convexus, sat nitidus, æneus, piceo-tinctus; capite postice punctato, medio læviore, antice rugato; thorace medio lævi, lateribus et basi sat fortiter punctatis, lateribus medio angulatis, impressis, angulis anticis fere rectis; elytris minus nitidis, sat fortiter striatis, striis punctatis, interstitiis leviter convexis, subtilissime coriaceis piceo æneoque mutantibus; stria octava basi cariniformi; pygidio piceo, fortiter punctato; metasterno medio lævi, ad latera et antice fortiter parce punctato.
Long. $6\frac{1}{2}$ lin.

Hab. Brazil.

This species is allied to *M. columbica*, Harold, but has the sides of the thorax strongly punctured.

BIBLIOGRAPHICAL NOTICE.

Memoir on the Anatomy of the Humpback Whale (Megaptera longimana, *Rudolphi*). By John Struthers, M.D. Edinburgh: Maclachlan & Stewart, 1889.

In this volume Prof. Struthers gives us the various observations * he made on the anatomy of the male Humpback Whale, 40 feet in length, which for five or six weeks disported itself in the Tay, at the end of 1883. The proximity of experienced whalers in Dundee, however, at length proved fatal to the interesting cetacean, as it fed on the young herrings and sprats, and other pelagic forms in the estuary. It was harpooned on the last day of December, but in no vital part, since the harpoons struck too high, and after a chase of twenty-one hours, in which it exhibited remarkable strength and endurance, the lines parted on the morning of 1st January and it was free. Shock, loss of blood, and the exhaustion of the chase, for it dragged for a time a steam-tug, a steam-launch, and two rowing-boats, proved too much for it, and it would seem to have died shortly afterwards without again venturing into St. Andrews Bay, otherwise the destination of the skeleton might have been different.

* Which appeared in the 'Journal of Anatomy and Physiology,' 1887–1889.

About a week afterwards the carcass, floated by the gases, was towed into Stonehaven and thence to Dundee.

The external characters are drawn up from views of the Whale as it lay on its dorsum at Stonehaven, and an accurate series of measurements is given of the various parts. The position in which the author at first examined the specimen prevented him from forming an accurate opinion with regard to the colour of the dorsal surface of the great flipper, but it really was entirely white, as described by Lilljeborg * and as stated in Bell's 'British Quadrupeds' †. The outline of the hump given by Prof. Struthers also differs from a sketch made on its arrival in Dundee, in so far that the posterior border was less acute distally. A more important divergence in external configuration, however, has been made by the author in regard to the tail, which, instead of having, as in his figure, a somewhat uniform line of fimbriæ posteriorly, presented on each side of the median hiatus (which is also deeper than shown) a prominent flap with four points. Thus the outline of the tail posteriorly was characteristic.

Amongst other interesting features described by the author are the mamillary pouch containing the small mammæ of the male, the hairs of the muzzle, and the whalebone.

In the second part of the treatise the anterior limbs and the rudimentary posterior limbs are elaborately examined, and contrasted with the same parts in *Balænoptera musculus*, the type with which the author compares throughout. The greater size of all the parts in *Megaptera* is clearly brought out; the proportions of the hand to the arm and forearm and the elongation of the phalanges being diagnostic, and fully explaining the nodulated condition of the flipper of *Megaptera*. It is noteworthy, however, that the finger-muscles are less than half the size of those of *B. musculus*, while the tendons showed an increase. The elaborate measurements, and even weights, of the various elements do credit to Dr. Struthers's assiduity. The hind limb is represented by a partially ossified pelvic bone supporting the *crura penis*, and a cartilaginous femur, the functions of which latter are obscure.

The third part treats of the vertebral column, which is characterized by the shortness of the bodies of the vertebræ when contrasted with those of other finners. The greatest vertebral body in *Megaptera* is the second of its 21 caudal vertebræ—the 33rd of its 52 vertebræ. A careful survey of the epiphyses, ridges, costal marks, hæmal tubercles and foramina, of the neural arches and canal, of the articular and other processes is given. The differences also between the various parts of this species and *B. musculus* are shown, such as the breaking up of the anterior border of the spinous process in *Megaptera*, and a decided triangular mesial projection on the posterior articular process of the last lumbar and first two caudal in the same species. In regard to the transverse processes,

* Scandinavian Cetacea, Flower, Ray Soc. p. 289 (1866).
† 2nd edition, London, 1874.

a few of the chief features are, their absence on the 15 posterior caudal vertebræ, and the upturning of the dorsal transverse processes. The spinous processes, again, are rhomboidal, in contrast with the battle-door shape of those of *B. musculus*.

The differences of the transverse processes of the axis in the two forms are interesting. Thus the upper and lower processes unite in *B. musculus*, forming a great common terminal plate external to the ring, whereas in *Megaptera* the ends of the processes are three inches apart. Generally the separated cervical vertebræ in *Megaptera* are of less breadth compared with the height than in *B. musculus*, and their structure would indicate more movement in the former than in the latter.

After the elaborate disquisition on the vertebræ, the author next discourses on the ribs. These are thicker and more curved in *Megaptera*, and they present a less distinct angle and external neck. They moreover enclose a proportionally larger thoracic cavity than in *B. musculus*. The sternum is narrower than in the latter, and the first rib lies behind the wing of the sternum. In this example of *Megaptera* also there was a wide oblique notch at the end of the first rib, best marked on the right.

The chevron bones are fewer than in *B. musculus*, and they have a wider arch at the top. The spines are less developed than in *B. musculus*.

The last part of the treatise contains an account of the skull, which is proportionally larger in *Megaptera*, its greater breadth being especially diagnostic. It has a large foramen magnum, the occipital plate of the temporal is also larger, and the temporal fossa is shorter and more posterior in position. The parietal has much greater expansion on the temporal fossa in *Megaptera*, and the sphenoid does not show itself on the surface. The differences in regard to the pterygoid, palate (which characteristically sends up a triangular process pushing the pterygoid outwards), and the broader malar in *Megaptera* are all carefully detailed. The characters of the orbit, transverse frontal fossa, nasal bones (fitted to a triangular spine of the frontals), anterior and posterior nares, ethmo-turbinals, and vomer are next examined, and the differences in contrast with *B. musculus* pointed out. In *Megaptera* also the maxillaries and premaxillaries present a marked fall for 7 or 8 inches along the beak, and they are much inclined inwards at and anterior to the nasals. The deficiences of the grooves in the palatal roof further distinguish *Megaptera* from *B. musculus*. The greater breadth of the median beam in the former is also noteworthy, and its brain-cavity is also broader; the tympanic bone is shorter in proportion to its breadth in *Megaptera*, and the form of the posterior division of the periotic is of special interest in connexion with Dr. Gray's remarks on *Megaptera novæ-zealandiæ*, the figure of the part in the latter presenting a close resemblance.

The treatise concludes with an account of the differences in the mandible and hyoid in the two species. Thus the coronoid process of the former is shorter, the dental foramen is nearer the

condyle in *Megaptera*, which also has a greater curvature and thickness of the body of the mandible, and shorter horns to the hyoid bone.

It is unfortunate that the soft parts of the Tay Whale were so decayed as to be useless for investigation, since many important features, *e. g.* the condition of the mucous membrane of the jejunum, were thus placed beyond the reach of the anatomist.

The work is a noteworthy contribution to the anatomy of *Megaptera*, though, perhaps, its interest and value might have been increased if more frequent references had been made to the labours of previous observers. A clearer conception of what has and what has not been previously described would thus have been obtained. Dr. Struthers, indeed, is to be congratulated on this further addition to his researches on the Cetacea, and though his official duties (from which, it is much to be regretted, ill-health has now relieved him) may have hampered and limited his work, yet this treatise is evidence of that scientific enthusiasm for which Scotch anatomists, such as the earlier Monros, Goodsir, and Turner, have been so famous. We look forward to further contributions from the pen of Dr. Struthers. W. C. M.

MISCELLANEOUS.

On Excavations made in Rocks by Sea-Urchins.

By J. Walter Fewkes *.

The author has had an opportunity of observing excavations made by *Strongylocentrotus dröbachiensis* on the coast of Grand Manan, New Brunswick, where the reefs of hard mica-schist with veins of harder quartzite are bare at low tide but covered at high water. The cavities were so numerous that the rock was roughly honeycombed with these shallow excavations, and, moreover, spreading Algæ (*Lithothamnion* and *Melobesia*) sometimes covered the rock and the cavities. The author, indeed, thinks the presence of the latter may be necessary to the Sea-Urchins "for some reason." It would be as useful, however, to speculate on the relation of the same to the boring Annelids, unless the Algæ are eaten by the Echini—just as the common British *Echinus* fills its intestine with fragments of the stems of *Laminariæ*, with perhaps a few fragments of the tubes of *Serpulæ*. He gives some interesting observations on the borings of *E. lividus* in pot-holes at Biarritz by Prof. Jules Marcou. In regard to the *modus operandi* of the borers Mr. Fewkes, after previous observers, gives the chief weight to the dental apparatus, probably assisted by the voluntary movements of the spines and the involuntary action caused by the waves moving the animal *in situ*. Two interesting plates illustrate the paper. W. C. M.

* 'American Naturalist,' January 1890.